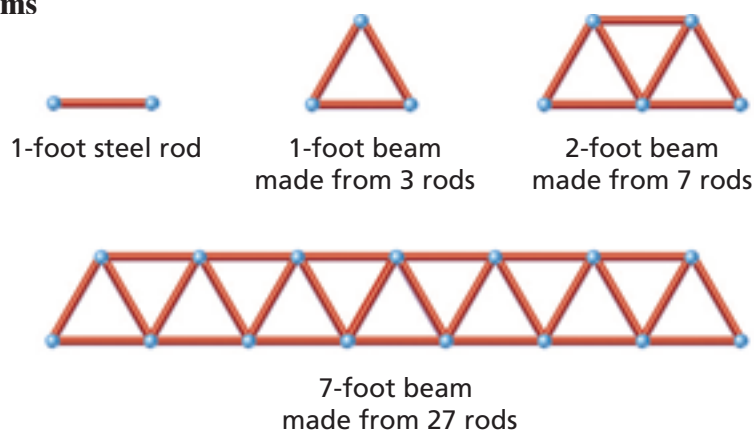


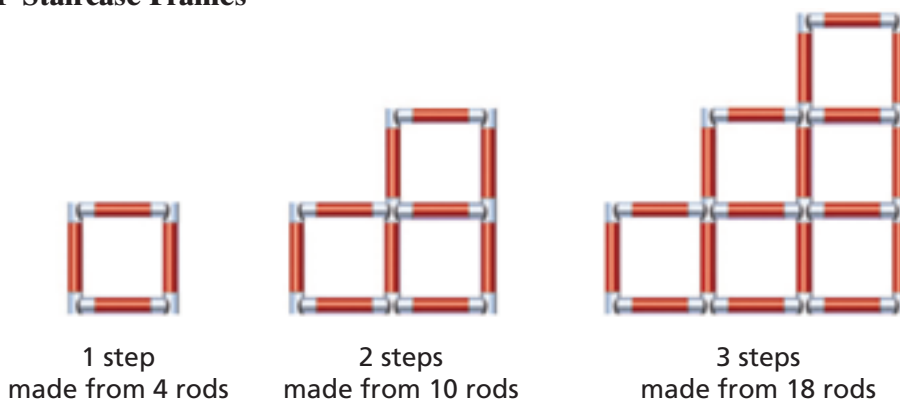
## 1.3 Custom Construction Parts

Suppose a company called Custom Steel Products (CSP for short) provides construction materials to builders. CSP makes beams and staircase frames by attaching 1-foot-long steel rods in the following patterns. CSP will make these materials in any size a builder needs.

### CSP Beams



### CSP Staircase Frames



The manager at CSP needs to know the number of rods required for each design in any size a customer might order. To figure this out, she decides to study a few simple cases. She hopes to find *trends*, or patterns, she can extend to other cases.

## Problem 1.3 Extending Patterns

- A. 1.** Copy and complete the table below to show the number of rods in beams of different lengths. **Hint:** Make drawings of the beams.

**CSP Beams**

Beam Length (ft)	1	2	3	4	5	6	7	8
Number of Rods	3	7	■	■	■	■	27	■

2. Make a graph of the data in your table.
  3. Describe the pattern of change in the number of rods as the beam length increases.
  4. How is the pattern you described shown in the table? How is it shown in the graph?
  5. How many steel rods are in a beam of length 50 feet? Explain.
- B. 1.** Copy and complete the table below to show the number of rods in staircase frames with different numbers of steps. **Hint:** Make drawings of the staircase frames.

**CSP Staircase Frames**

Number of Steps	1	2	3	4	5	6	7	8
Number of Rods	4	10	18	■	■	■	■	■

2. Make a graph of the data in your table.
  3. Describe the pattern of change in the number of rods as the number of steps increases.
  4. How is the pattern you described shown in the table? How is it shown in the graph?
  5. How many steel rods are in a staircase frame with 12 steps?
- C.** How is the pattern of change in Question A similar to the pattern in Question B? How is it different? Explain how the similarities and differences are shown in the tables and graphs.
- D.** Compare the patterns of change in this problem with the patterns of change in Problems 1.1 and 1.2. Describe any similarities and differences you find.

**ACE** Homework starts on page 12.